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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,040	10/18/2001	Robert J. Crowley	267/017	8429

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EXAMINER

CONNOLLY, PATRICK J

ART UNIT PAPER NUMBER

2877

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/020,040

Applicant(s)

CROWLEY ET AL.

Examiner

Patrick J Connolly

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12, 38 and 39 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. Patent No. 5,830,145 to Tenhoff.

As to claim 1, Tenhoff discloses an imaging system including (see Figures 7, 8):

an ultrasound console having an input (104);

an interferometer (Figure 8);

wherein the ultrasound console processes data provided by the interferometer to form an image for display (104).

As to claims 2, 3, 8 and 9, applicant should note that it has been held that the recitation that an element is “adapted to” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchinson, 69 USPQ 138.

As to claim 4, Tenhoff discloses multiple inputs coupled to the ultrasound console (see column 2, lines 29-31).

As to claim 5 and 6, Tenhoff discloses a catheter (see Figure 9).

As to claim 11, Tenhoff discloses an interferometer comprising (see Figure 8):

Art Unit: 2877

means for creating a sample light beam and a reference light beam from a light source (208-210, 225-233);

means for conveying the sample light beam to a sample (207, 208);

means for introducing a time delay (226);

means for combining said beams for detection (208, 211);

As to claim 38, Tenhoff discloses a method of analyzing a surface comprising the step of processing data from an interferometer by an ultrasound processor into an image for display (see bottom column 9, top of column 10 and figures 7 and 8).

As to claims 7, 10, 12, 39, Tenhoff discloses, by way of incorporation of reference of U.S. Patent No. 5,321,501 to Swanson et al, a method and apparatus for analyzing a surface including (see Swanson figure 9, also column 15, lines 34-65): forming a sample and reference light beam by way of an interferometer; combining light received from the surface with reference light beam; detecting combined light with a multi element detector to output a plurality of parallel signals; converting processed parallel signals to serial signal; and providing the serial signal to the ultrasound processor for imaging.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-16, 28 and 32, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,830,145 to Tenhoff as applied to claims 1-12, 38 and 39 above, and further in view of U.S. Patent No. 5,943,133 to Zeylikovich et al.

As to claims 13-16, 28 and 32, Zeylikovich teaches a method and apparatus for performing optical coherence tomography including using a diffraction grating to introduce a time delay and combining beams (see for example figure 11). Zeylikovich also teaches using multiple beam splitters to combine light, as is notoriously well known in the art.

It would have been obvious to one of ordinary skill in the art at the time of invention to include a diffraction grating and multiple beam splitters in the ultrasound console with interferometer combination of Tenhoff, as these interferometers are used for similar measurements, and are well known to be used in combination with ultrasound measuring techniques.

Claims 17-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,830,145 to Tenhoff and further in view of U.S. Patent No. 5,943,133 to Zeylikovich as applied to claims 13-16 above, and further in view of U.S. Patent No. 6,143,003 to Tearney et al (hereafter Tearney).

As to claims 17-20, 22, 24, 25, 29, 33 and 34, Tearney teaches a method and apparatus for performing optical coherence tomography including an interferometer (see Figure 3, column 6, lines 15-25). In the interferometer, Tearney teaches that the optical couplers (acting as beam splitters) do not have to divide radiation equally. Tearney goes on to explain that the division of radiation should be determined by noise limitations. It would have been obvious to one of

Art Unit: 2877

ordinary skill in the art at the time of invention to choose a combination beamsplitters of different proportions in the apparatus of Zeylikovich in order to improve measurements.

As to claims 21, 26, 28 and 32, Tenhoff teaches, by way of incorporation of reference of U.S. Patent No. 5, 321, 501 to Swanson et al, a method and apparatus for analyzing a surface including (see Swanson figure 9, also column 15, lines 34-65): forming a sample and reference light beam by way of an interferometer; combining light received from the surface with reference light beam; detecting combined light with a multi element detector to output a plurality of parallel signals; converting processed parallel signals to serial signal; and providing the serial signal to the ultrasound processor for imaging.

It would have been obvious to one of ordinary skill in the art at the time of invention to include this parallel to serial processing in combination with the diffraction grating and beam splitter combinations above, as it is well known to perform this sort of measurement in interferometry.

As to claim 27, 31 and 37, Zeylikovich teaches a focusing lens. It would have been obvious to one of ordinary skill in the art at the time of invention to include this lens in the apparatus of Tenhoff as it is notoriously well known in the art to use focusing lenses to improve measurement quality.

As to claims 23 and 32, Tearney teaches using optical circulators to direct light beams (Figure 3, 30). Optical circulators are notoriously well known in the fiber art. It would have been obvious to one of ordinary skill in the art at the time of invention to include circulators for light direction in the apparatus of Zeylikovich.

Art Unit: 2877

As to claims 30, 35 and 36, Tearney teaches using attaching an interferometer to a catheter (see Figure 12, also column 12). It would have been obvious to one of ordinary skill in the art at the time of invention to attach a catheter to the apparatus of Zeylikovich (see also column 1 of Zeylikovich).

As to claims 32-37, Zeylikovich teaches using fibers to transport light (see lines 30-40, also Figures 29, 30). Fibers are notoriously well known in the art and it would have been obvious to use them to transport light in the apparatus of Tenhoff.

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,830,145 to Tenhoff.

As to claim 40, it would be obvious to one of ordinary skill in the art at the time of invention to choose a coupling sequence for the method and apparatus of Tenhoff depending on the desired order testing and measurement operations

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 16-20 and 22-37 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-52 of copending Application No. 10,017,534 in view of U.S. Patent No. 5,830,145 to Tenhoff.

Tenhoff teaches using an interferometer to make ultrasound measurements, for example, using the one incorporated by reference of U.S. Patent No. 5,321,501 to Swanson et al.

As to claims 16-20 and 22-25, though the apparatus described is broader than those of copending claims 1-15 as it includes an ultrasound console, it would be obvious to one of ordinary skill in the art at the time of invention to use the interferometer of copending claims 1-15 with an ultrasound console as taught by Tenhoff.

As to claims 28-31, though the apparatus described is broader than those of copending claims 22-32 as it includes an ultrasound console, it would be obvious to one of ordinary skill in the art at the time of invention to use the interferometer of copending claims 22-32 with an ultrasound console as taught by Tenhoff.

As to claims 32-37, though the apparatus described is broader than those of copending claims 33-52 as it includes an ultrasound console, it would be obvious to one of ordinary skill in the art at the time of invention to use the interferometer of copending claims 33-52 with an ultrasound console as taught by Tenhoff.

This is a provisional obviousness-type double patenting rejection.

Art Unit: 2877

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick J Connolly whose telephone number is 703.305.4397.

The examiner can normally be reached on 9 am-5.30 pm ... Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 703.308.4881. The fax phone numbers for the organization where this application or proceeding is assigned are 703.746.7722 for regular communications and 703.746.7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0956.

pjc *PS*
July 9, 2003


Frank G. Font
Supervisory Patent Examiner
Technology Center 2800